

REMARKS

After entry of the present amendment, claims 1-21 are pending. Claim 1 has been amended. Claims 11-21 have been added.

Issues under 35 USC 102/103

The Examiner rejected claims 1-3, 7, and 10 as being anticipated by Nowicki ('607). The Examiner further rejected claims 8 and 9 as being obvious in view of Nowicki in combination with Applicants' admitted art, and claim 4 in view of Nowicki in combination with Frieser et al ('578), and claim 5 and 6 in view of Nowicki in combination with Frieser et al and the Grill article.

Applicants have amended claim 1 to point out specifically that the upper surface of the sacrificial substrate holder be parallel with the upper surface of the substrate during etching. This is different from Nowicki, which shows a beveled upper edge for the annulus 15. A beveled upper edge as shown by Nowicki has the advantage of allowing substrate to be loaded into the annulus interior more easily and in a somewhat self-guided manner. This is one advantage admittedly. Nowicki also suggested at col. 4 lines 4-10 that the height of the ring can be varied to change the surface area of the sacrificial material exposed to the etch reaction. In other words, the amount of vertical surface exposure is variable to allow the etch to be fine-tuned. Fig. 2 of Nowicki and the discussion associated therewith suggest that when substrate 13 is lowered onto the surface of first base member 17 for etching, vertical surfaces of annulus 15 surround the substrate to present additional etchable material to the plasma.

In contrast and as recited in amended claim 1, Applicants' claimed invention requires, in combination, that the upper surface of the sacrificial substrate holder be parallel with the upper surface of the substrate during etching (see support at, for example, Fig. 5 and page 8, lines 14-15). Doing so allows the entire substrate/holder assembly to appear as a larger substrate to the plasma cloud (see page 5, line 28-29), to alleviate back diffusion (this back diffusion issue is discussed in the specification at, for example, page 10 lines 1-4), and to render the etch more uniform. It is respectfully submitted that Nowicki's arrangement would

not address the back diffusion in the advantageous manner cited in amended claim 1 since the vertical surfaces of annulus 15 will tend to act, to a much greater degree, as a dam to concentrate more plasma at the periphery of the substrate when the substrate is lowered into the inside of annulus 15 for etching. Such damming effect would not be present to the same degree with the arrangement of Applicants' amended claim 1 since the two surfaces are parallel to one another.

Claim 11 requires not only that the two surfaces be even with one another but also that the sacrificial substrate holder be dimensioned such that the plasma cloud extends beyond its outer periphery. Such a requirement allows the etch process to utilize the flatter part of the etch rate graph (see Fig. 2) for etching the substrate. The result is a more uniform etch across the substrate surface than possible if the plasma is dammed and concentrated around the substrate periphery, as would be the case if vertical surfaces are presented above the substrate horizontal surface as in Nowicki.

Because of the features discussed above and others in the combinations, it is respectfully submitted that claims 1 and 11 should be allowable.

Further, the combination which includes the above-discussed amended feature is not found in the other cited art (e.g., Frieser et al., the Grill article, Applicants' admitted prior art). Thus, it is respectfully submitted that the rejections under 35 USC 103 should be withdrawn and that claims 1 and 11 should be allowed as patentable.

Applicants further respectfully submit that the claims herein that depend directly or indirectly from claims 1 and 11, in addition to being patentable due to their dependency from their patentable parent claims, also recite other features to render them further patentable in their combinations. For example, claim 18 requires the additional feature that the lower surface of the substrate be in direct contact with the helium-cooled chuck. This combination is not shown in Nowicki since Nowicki simply does not show the direct contact with helium chuck feature. The combination of claim 19 further requires the sacrificial substrate holder fit the substrate snugly, which is different from Nowicki which suggests the presence of a gap between the annulus 15 and the substrate for ease of substrate loading. As another example, the combination of claim 20 requires that the etchant source gas be released into said plasma processing chamber by injection via a showerhead having a preferential injection pattern to further improve the etch uniformity across the semiconductor substrate. Again, this combination is neither shown nor

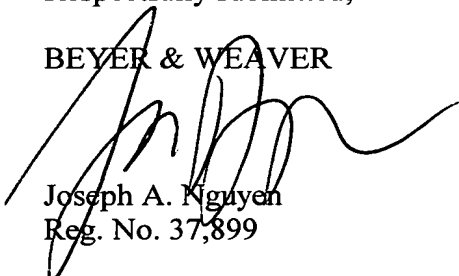
suggested by Nowicki. Accordingly, the allowance of claims 2-10 and 12-21 is also respectfully urged.

In view of the amendment and remarks set forth above, it is respectfully submitted that the application is in condition for allowance and action to that effect is respectfully requested at an early date. If the Examiner feels that a telephone conference would expedite allowance of this application, the Examiner is invited to call the undersigned at (650) 831-6500.

The Commissioner is authorized to charge any fees that may be due to our Deposit Account No. 50-0388 (Order No. LAM1P061). A duplicate copy of the transmittal sheet for this amendment is enclosed for this purpose.

Respectfully submitted,

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